CENTER FOR NEURAL INTERFACES

CENTER

Established in 1995, the Center for Neural Interfaces transforms the neuroprosthetic technologies developed by the Moran Center for Applied Visual and Neural Science into prototype systems that will subsequently be commercialized for use in neuroscience research and clinical application, e.g. limited restoration of vision in the blind, or a command interface for spinal cord injured individuals.

TECHNOLOGY

The Center is focused on the development of technologies that will permit bi-directional (i.e. stimulation and recording) communication with large numbers of neurons in the central and peripheral nervous systems. The Center has successfully developed silicon-based arrays of microelectrodes that can either listen in on or talk directly to hundreds of neurons simultaneously. The center has developed surgical tools and techniques that allow these high-density microelectrode arrays to be implanted in central and/or peripheral nervous systems. It has also developed data acquisition systems that permit the large amounts of data recorded by these microelectrode arrays to be stored and analyzed in PC-class computers. It has written software that is used to acquire and analyze these neural signals. The long-range goal of the Center is to use these new neural interfaces as therapies for disorders of the nervous system e.g. limited, but functional sensory restoration in individuals with profound blindness or deafness, and enhanced motor function to individuals with high spinal cord injuries.

ACCOMPLISHMENTS

The Center has commenced the implantation of the microarrays in human subjects. One patent application was filed and three inventions were disclosed. Two patents have been issued. Technologies that have been successfully commercialized include manufacturing and implantation of the microelectrode array, support systems for simultaneous recording and storing of neural signals from 100 microelectrodes, and systems of high–count implantable microribbon cables. Prototype hardware for acute human investigations has been developed. Success has promoted future testing with human subjects and the Center is developing its technologies for future clinical applications.

Bionic Technologies, Inc. has successfully commercialized the prototypes developed at the Center to the international scientific community. Since its inception the company has already received three Phase I and two Phase II SBIR awards, a total of $1.7million in federal support.

CONTACT

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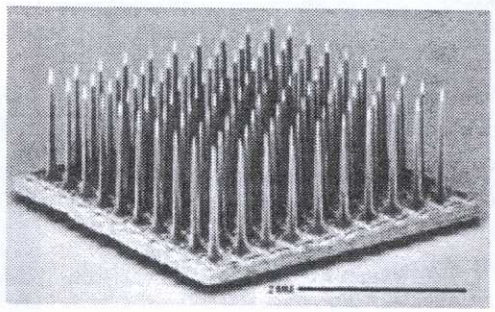
Can You Imagine...

. . . a miniature camera whose video output is fed to the visual cortex of a sight impaired person to provide artificial vision with sufficient resolution for key object identification?

THE CENTER WAS ESTABLISHED TO TRANSFORM THE NEUROPROSTHETIC TECHNOLOGIES DEVELOPED BY THE MORAN LABORATORIES FOR APPLIED VISUAL AND NEURAL SCIENCE INTO PROTOTYPE SYSTEMS FOR FUTURE CLINICAL APPLICATIONS.



Microelectrode array, US Patent #5,215,088, used as part of the electrode array system to monitor and stimulate brain cell activity